

REMARKS

Claims 26-49 remain pending in this application. Further reconsideration of this application is requested.

The previous grounds of rejection of claims 1-6, 8-13, and 15-25 under 35 U.S.C. § 102 and § 103 as being either anticipated by or unpatentable over Sweatt et al., U.S. Patent Application No. 2002/0105725, Jepsen et al., U.S. Patent No. 6,172,792, Moseley et al., U.S. Patent No. 6,124,920 or Oda et al., U.S. Patent No. 6,476,550, have been withdrawn, and claims 26-49 now stand rejected as allegedly being obvious over various proposed combinations of a group of newly cited prior art references to Popovich et al., U.S. Patent No. 6,687,030, Taniguchi et al., U.S. Patent No. 6,445,406, and Rostoker et al., U.S. Patent No. 5,340,978, in further combination with Oda et al. and Jepsen et al. The new grounds of rejection have been carefully reviewed, and are respectfully traversed.

To reiterate, the present invention as disclosed and claimed is directed to a focusing device that uses a diffraction grating pattern to focus light from a subject onto a focal plane, such as onto an image sensor of an image capturing device. For example, the focusing device of the invention would be used instead of a conventional refractive lens apparatus.

As with the now-withdrawn prior grounds of rejection, none of the prior art references relied upon in the various outstanding grounds of rejection discloses a diffractive focusing device or image capturing apparatus utilizing a diffractive focusing device as claimed in the subject application.

Popovich et al. is directed to an apparatus for illuminating a display screen that contains an electronically generated image displayed thereon. In particular, Popovich discloses apparatus for illuminating a color sequential display, wherein successive monochromatic image components of a final color image are illuminated with corresponding red, green or blue light, in a rapidly switched manner so that an observer effectively sees a full color image. The monochromatic image components are generated on the display by electrical signals from an image control circuit, and are not focused onto the display from a subject.

Contrary to the present invention as recited in the claims, and in particular claim 26, Popovich does not disclose a diffractive focusing device for focusing light from a subject onto a focal plane. By definition, focusing light from a subject onto a focal plane results in an image of the subject being projected onto the focal plane. Popovich discloses no such operation. Popovich instead collimates light from a white light source 100 (see Fig. 2) using a collimator 104, and then separates out red, green and blue bandwidth components of the white light with a filter 202. The collimator 104 is in effect the opposite of a focusing device, in that it takes incident light from the white light source 100 and collimates it into a parallel beam 106 of white light.

Similarly, the switchable optics system 208 does not focus light from any subject onto a focal plane. Instead, the system 208 utilizes a switchable holographic optical element as shown in Fig. 11 to perform an illuminating light directing function that directs particular color bandwidth components onto specific areas of the image display so as to selectively illuminate sequential monochromatic images with corresponding red, green or blue light to obtain a composite full color image by rapid switching of displayed monochromatic images.

Significantly, Popovich discloses that the switchable holographic optical element functions in an active state to diffract a particular bandwidth component of collimated incident light while passing the other two bandwidth components without alteration, and functions in an inactive state to transmit all components without alteration (see col. 2, II. 18-24; col. 10, I. 52- col. 11, I. 6; col. 11, II. 19-30). Thus, contrary to the requirements of claim 26, the switchable holographic optical element of Popovich does not operate to be either selectively light transmissive or selectively light opaque, but instead is transmissive at all times. The various cycles of the holographic optical element function only to selectively diffract particular bandwidth components, or not. The holographic optical element is never controlled to be selectively light opaque as set forth in the claims.

Taniguchi et al. relates to a stereoscopic image display apparatus having a lenticular lens for redirecting images to different regions, such as the left and right eyes of an observer, and in this respect Taniguchi is similar to the Moseley et al. reference that has been withdrawn as a reference against the claims. Taniguchi is wholly irrelevant to

any teaching or use of the Popovich color sequential display, and as such one of ordinary skill in the art would not have been motivated by Taniguchi to modify the Popovich apparatus as proposed in the Office action. The proposed modification of Popovich would make no sense to one skilled in the art, because Popovich does not relate to production of stereoscopic images. Further, even if combined as suggested, the resultant apparatus still would not meet the requirements of the claims because Taniguchi fails to cure the fundamental deficiencies of Popovich with respect thereto.

The Office action further proposes to modify the Popovich display to include an image sensor, allegedly as suggested by Rostoker et al. This proposed modification also is respectfully submitted to be unobvious, since it would solve no problem and accomplish no purpose. In particular, there would be no need to employ any image sensor with the display of Popovich "for providing a complete representation of the incident image" as alleged in the Office action, because the Popovich display is not an image capturing device. Popovich already provides a complete representation of the image generated on the display, and thus there is no need for any image sensor. As such, it is apparent that the only suggestion for making such a combination has come from a hindsight reading of the present application, and therefore this ground of rejection is not properly supported under 35 U.S.C. § 103.

As previously explained, Jepsen et al. is directed to a diffraction grating that is used for redirecting light, as shown in Figs. 1a and 1b, such as light from a color display. The diffraction grating does not focus incident light onto a focal plane, but simply redirects the light to another direction, as shown. Instead, the light is focused on the grating itself. Oda et al. is directed to an organic electroluminescent device that includes a diffraction grating or zone plate (see Fig. 6), which is formed at a location where the diffraction grating suppresses total reflection at an interface of the electroluminescent device. The zone plate or diffraction grating does not focus light and is not used to focus light onto any focal plane.

Thus, no combination of Jepsen and/or Oda with any of the newly cited prior art references could result in the invention as particularly set forth in claims 26-49. Withdrawal of these grounds of rejection are therefore also respectfully urged.

In view of the foregoing, it is apparent that none of the prior art references relied on in the various grounds of rejection is relevant to the diffractive focusing device and image capturing apparatus as disclosed and claimed in claims 26-49 pending in this application.

Conclusion

In view of the foregoing, claims 26-49 are submitted to be patentable over the prior art of record, whether considered individually or in combination. Withdrawal of the outstanding grounds of rejection and the issuance of a Notice of Allowance are earnestly solicited.

Please charge any fee or credit any overpayment pursuant to 37 CFR 1.16 or 1.17 to Deposit Account No. 08-2025.

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